

specifically the support posts 30 and rotor shaft 40, are sectional. Providing these members as a plurality of sections, rather than as single monolithic pieces, offers two distinct advantages. First, as described above with respect to conduits 300' and 300", the life of the components can be extended at a minimal cost by selecting corrosion-resistant ceramic for the section that contacts the highly corrosive surface of bath B and selecting less expensive graphite for the other sections or, if each section is graphite, the section exposed to the caustic surface, which wears out more quickly than the other sections, can be replaced without having to replace the entire member. Second, molten metal pumps come in different sizes and in varying heights. Currently, a separate inventory of posts and shafts, differing in length according to the height of the pump on which they are to be used, must be maintained for each pump height offered. By making the vertical members described herein sectional, a single inventory of parts can be used and, when the length of a component needs to be increased or decreased to fit the height of a pump, a section can either be added or removed to adjust the height of the component. Although it is preferred that one sectional length be used, the objects of the invention, with respect to this particular aspect, would be achieved as long as there are fewer lengths of sectional components than there are pump heights.

Finally, as shown in Fig. 14, the present invention may also be a pump including a thermocouple 600 mounted within a support post 30. Thermocouple 600 includes a temperature-sensing means 602, a cord 604 and a connector 606. In this embodiment, support post 30 includes an axial bore 610 that receives means 602 and cord 604. One advantage of this arrangement is that the thermocouple is not subjected to the caustic environment of the molten metal bath and therefore, has a longer life. Another advantage is that the thermocouple is positioned at one depth within the bath; it is not pushed about by the currents within the bath. Therefore, the temperature reading is more accurate. It is also contemplated that the thermocouple could be embedded or formed within the pump base or another stationary pump component.

A preferred embodiment having now been described, it will be understood that the invention is not thus limited, but is instead set forth in the appended claims and legal equivalents thereof.

connection with said output port without the use of cement or other sealant.

- 5
9. A transfer pump as defined in claim 8 wherein said output port and said discharge form an angled opening for receiving an end of said metal-transfer conduit.
10. A device for pumping molten metal, said device comprising a motor and a pump base having an input port, a chamber and a discharge leading to an output port, said device further comprising a rotor within said pump chamber, said rotor extending beyond said input port.
- 10 11. A device as defined in claim 10 wherein said rotor is imperforate.
12. A device as defined in claim 11 wherein said rotor is trilobal.
13. A device as defined in claim 11 wherein said rotor is quadrilobal.
- 15 14. A device as defined in claim 11 wherein said device further-comprises a chamber wall and said rotor includes one or more vanes wherein at least one of said vanes includes a portion that directs molten metal into said chamber and at least one of said vanes includes a portion that directs molten metal outward against the wall of said chamber.
- 20 15. A metal-transfer conduit comprised of a plurality of interconnected sections.
16. A support post for a molten metal pump comprised of a plurality of interconnected sections.
- 25 17. A rotor drive shaft for a molten metal pump comprised of a plurality of interconnected sections.
18. A metal-transfer conduit as defined in claim 15 wherein said sections are interconnected without the use of cement or other sealant.
- 30 19. A metal-transfer conduit as defined in claim 15 wherein one of said sections is comprised of ceramic and the other sections are comprised of graphite.
- 35 20. A method for removing a metal-transfer conduit from a molten metal pumping device, said method comprising the steps of:
- a. providing a molten metal bath;
 - b. providing a molten metal pumping device positioned in the molten metal bath,

30. A rotor drive shaft having a first end connectable to a rotor and a second end connectable to a coupling member having a socket with two flat surfaces and two radial surfaces, said second end having two flat surfaces, whereby said second end is received in said socket and said rotor shaft is primarily driven by the force transferred from said flat surfaces of said socket to said flat surfaces of said second end.

5

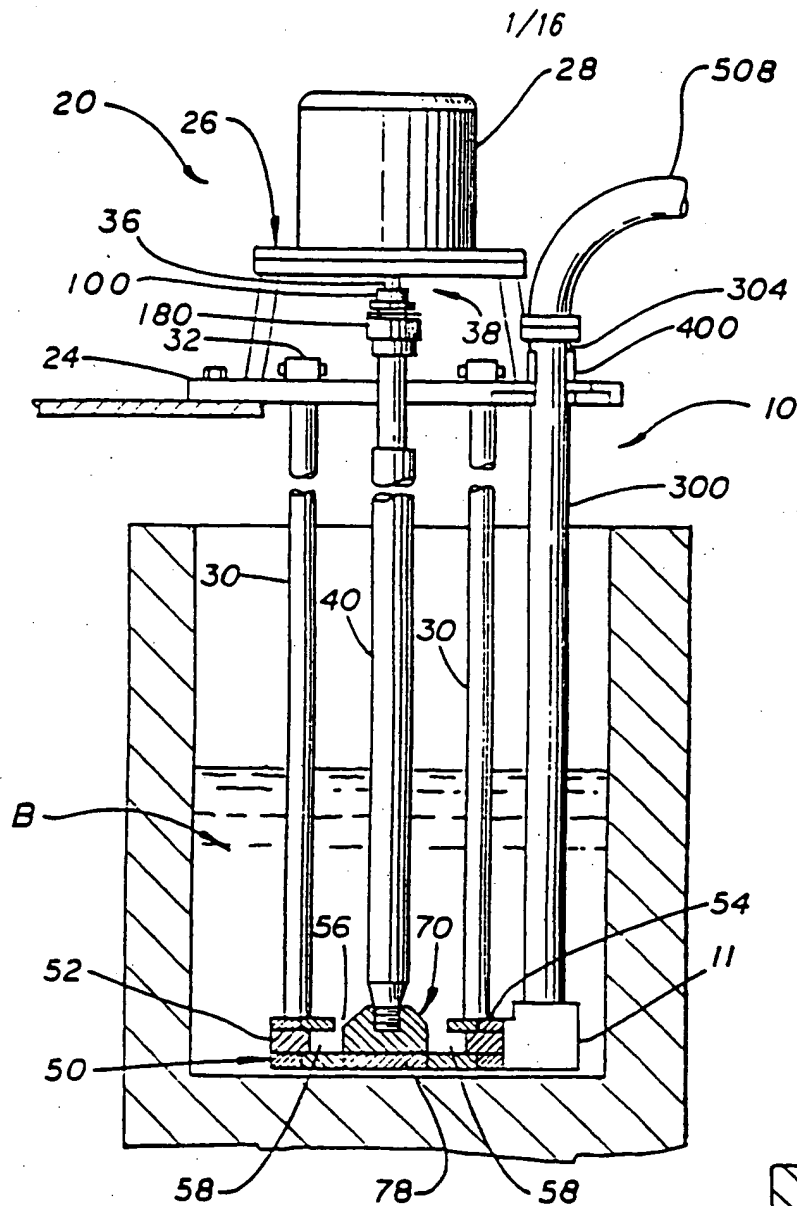


FIG. 1

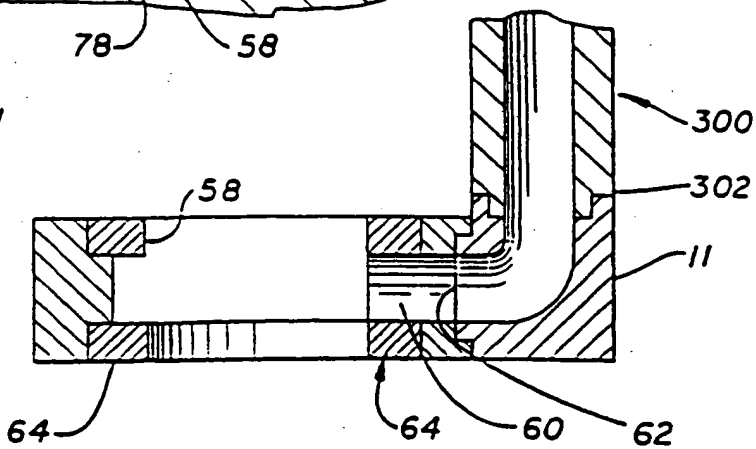
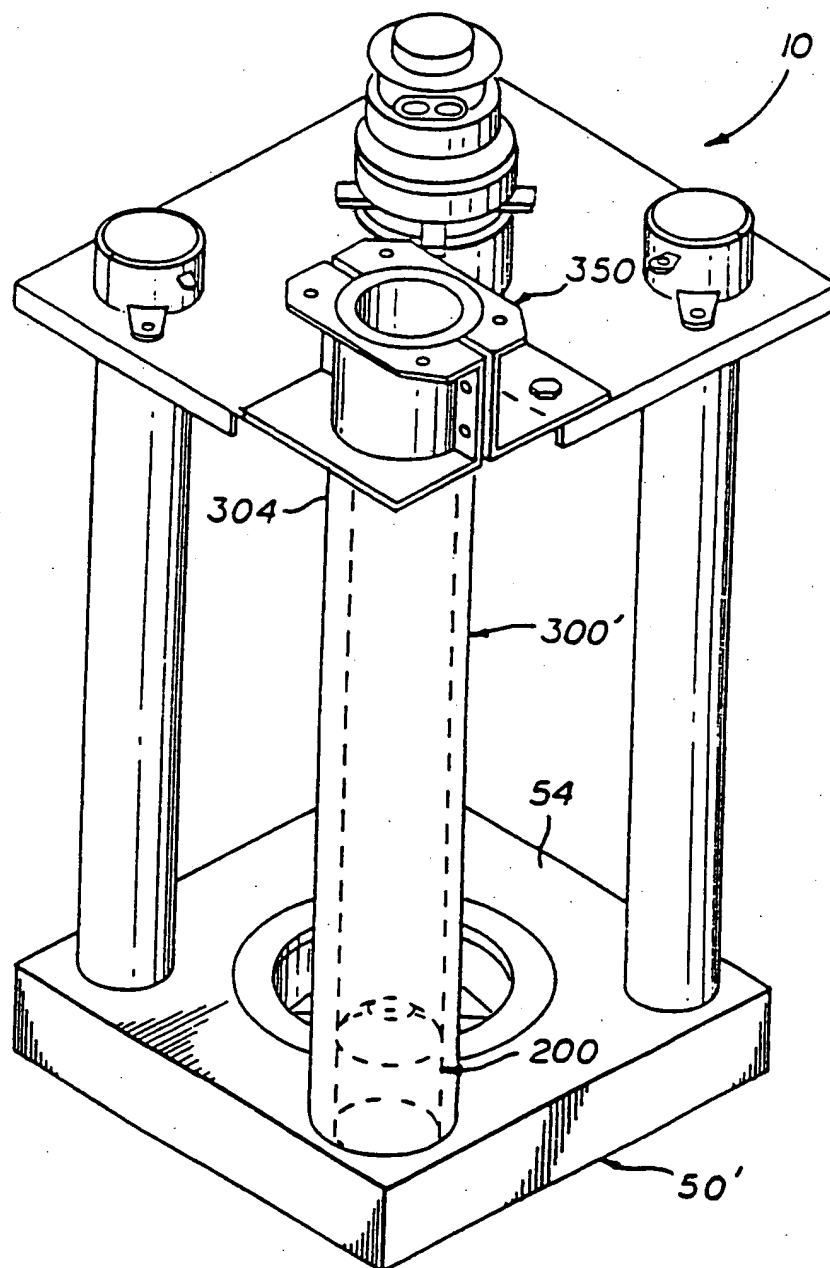


FIG. 1a

FIG. 2



3/16

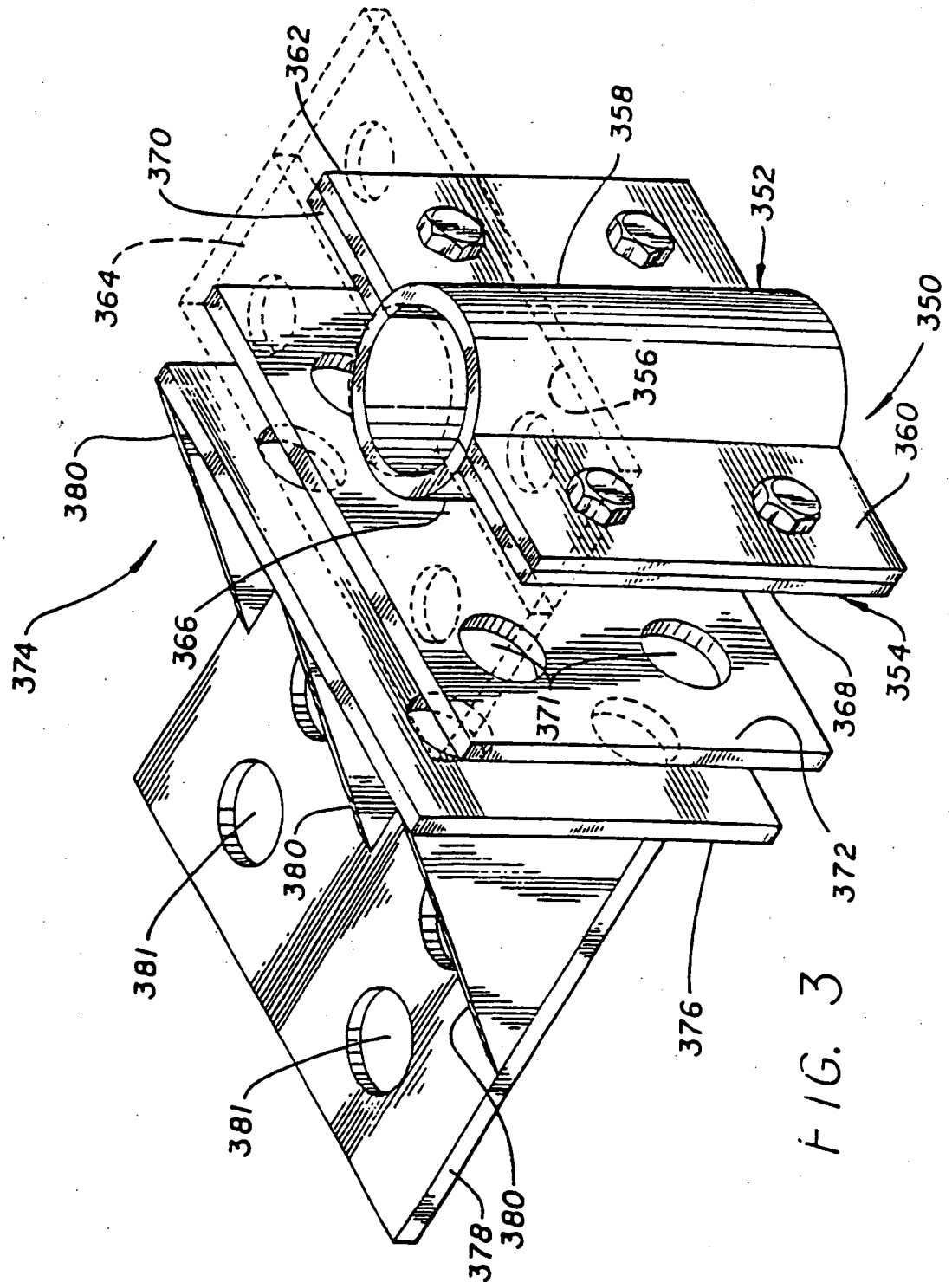


FIG. 3

SUBSTITUTE SHEET (RULE 26)

4/16

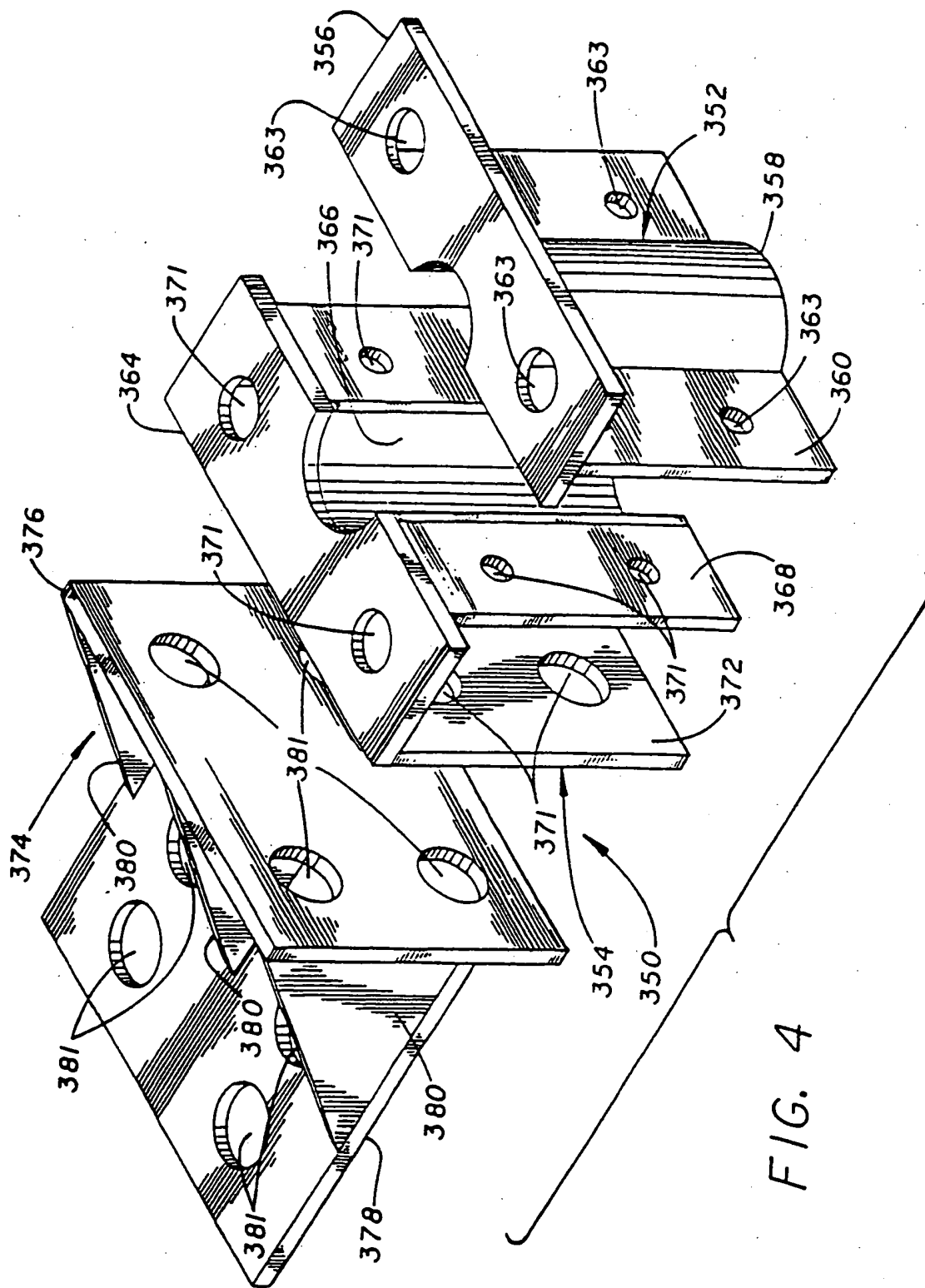
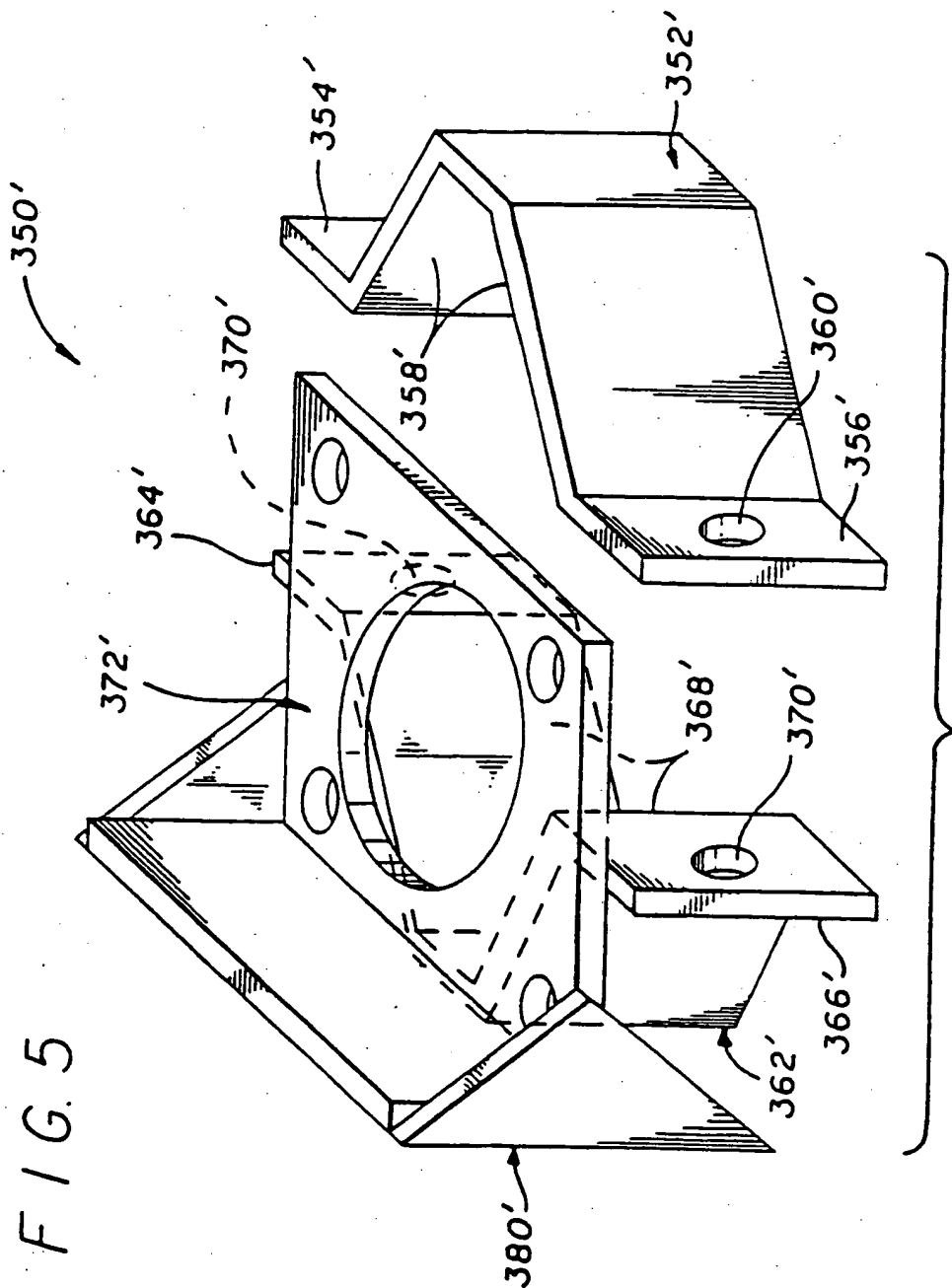


FIG. 4

SUBSTITUTE SHEET (RULE 26)

5/16



SUBSTITUTE SHEET (RULE 26)

6/16

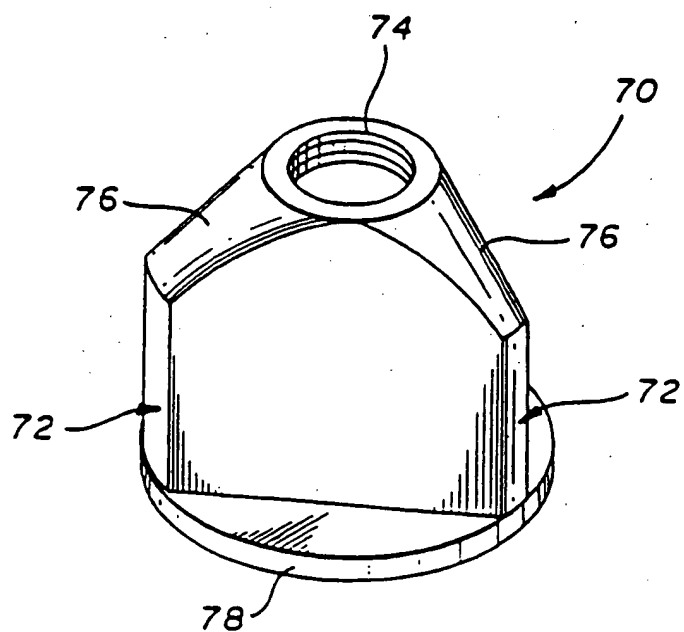


FIG. 6

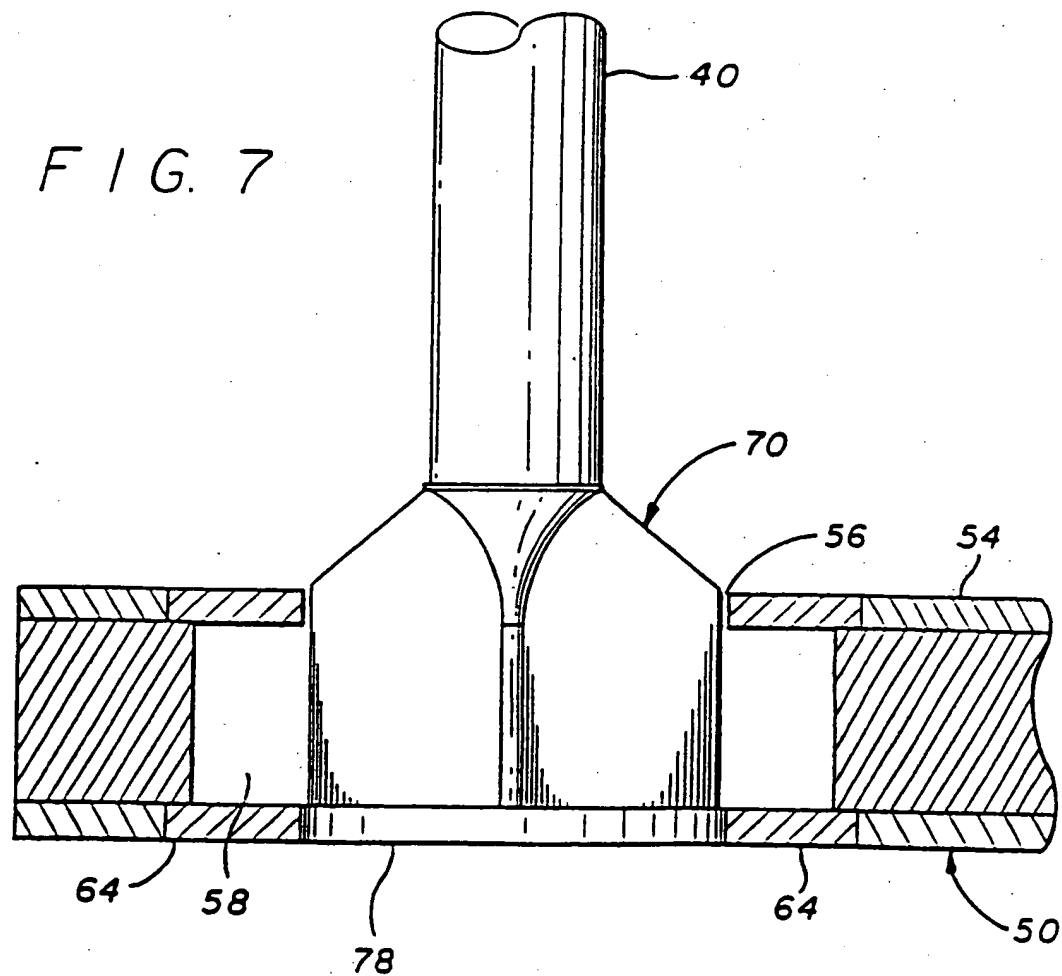


FIG. 7

SUBSTITUTE SHEET (RULE 26)

7/16

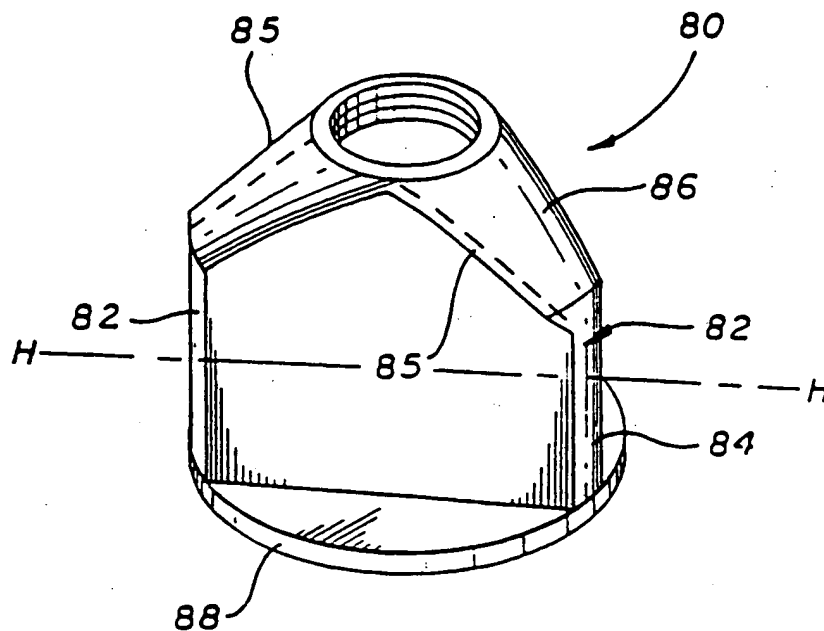


FIG. 8

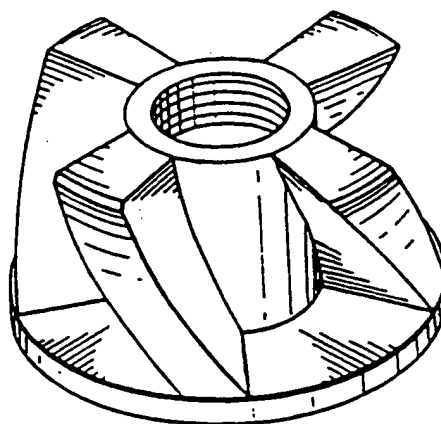


FIG. 9a

8/16

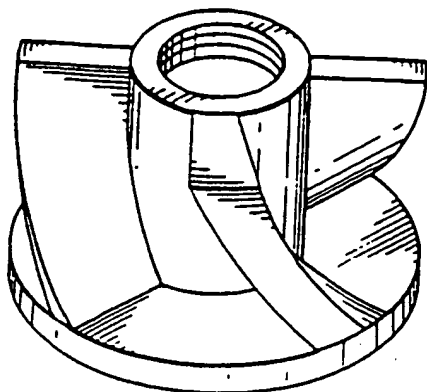


FIG. 9b

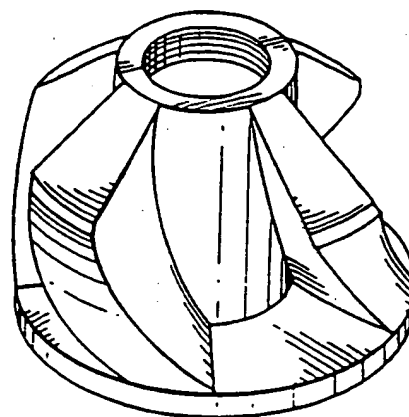


FIG. 9c

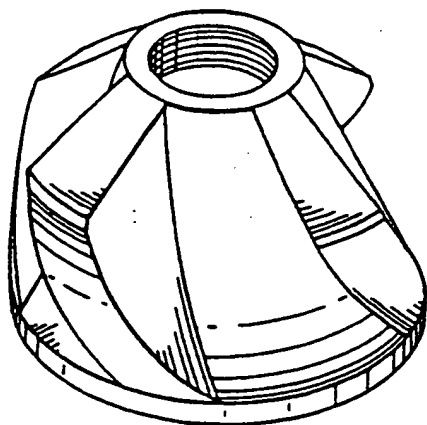


FIG. 9d

9/16

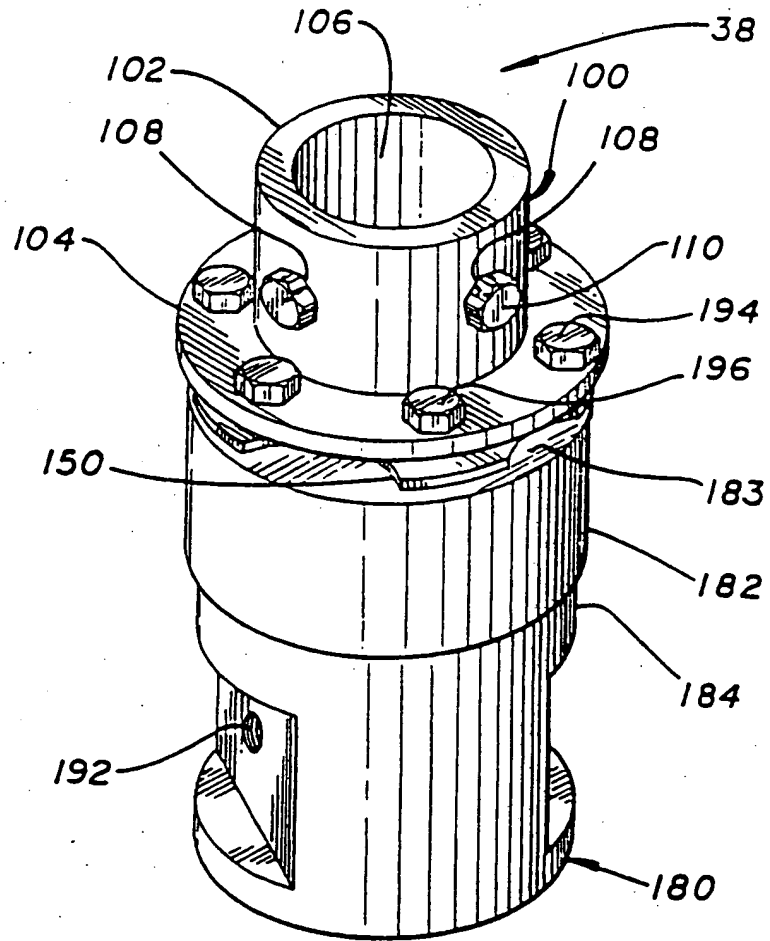


FIG. 10

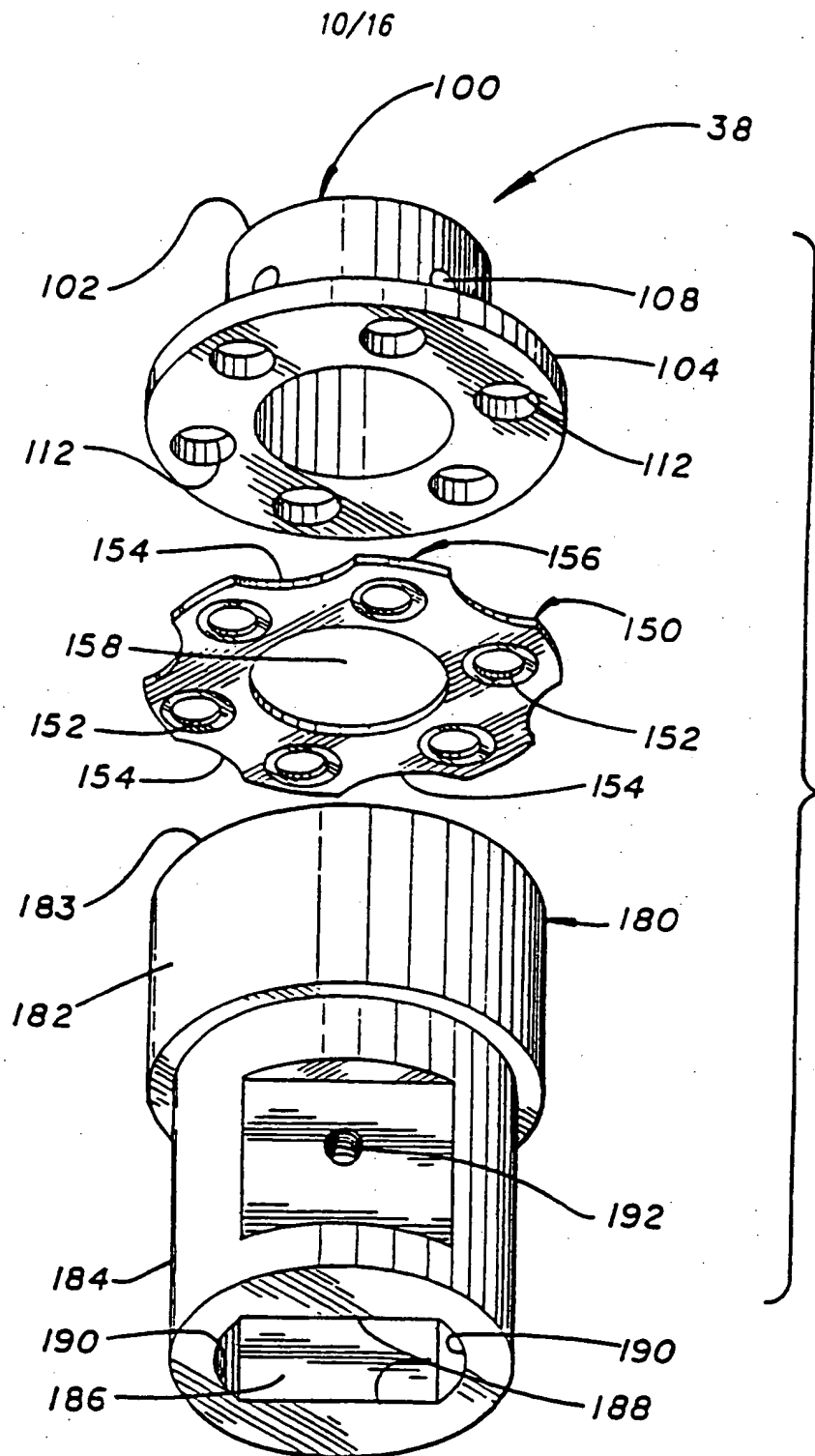


FIG. 10a

11/16

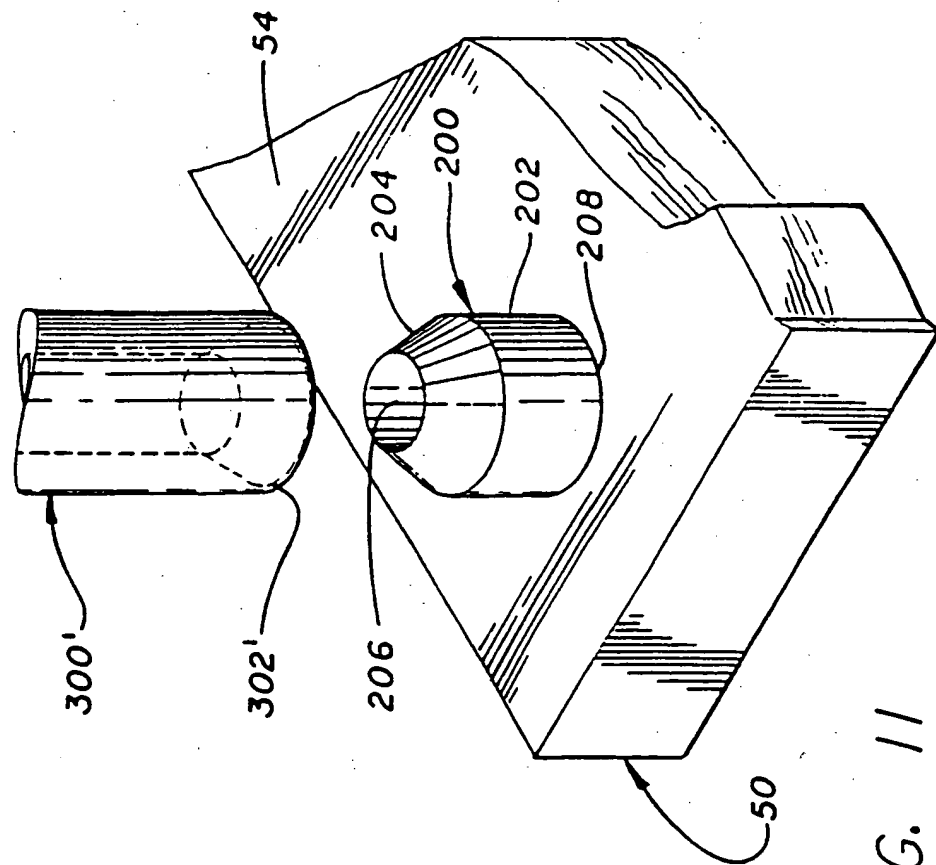
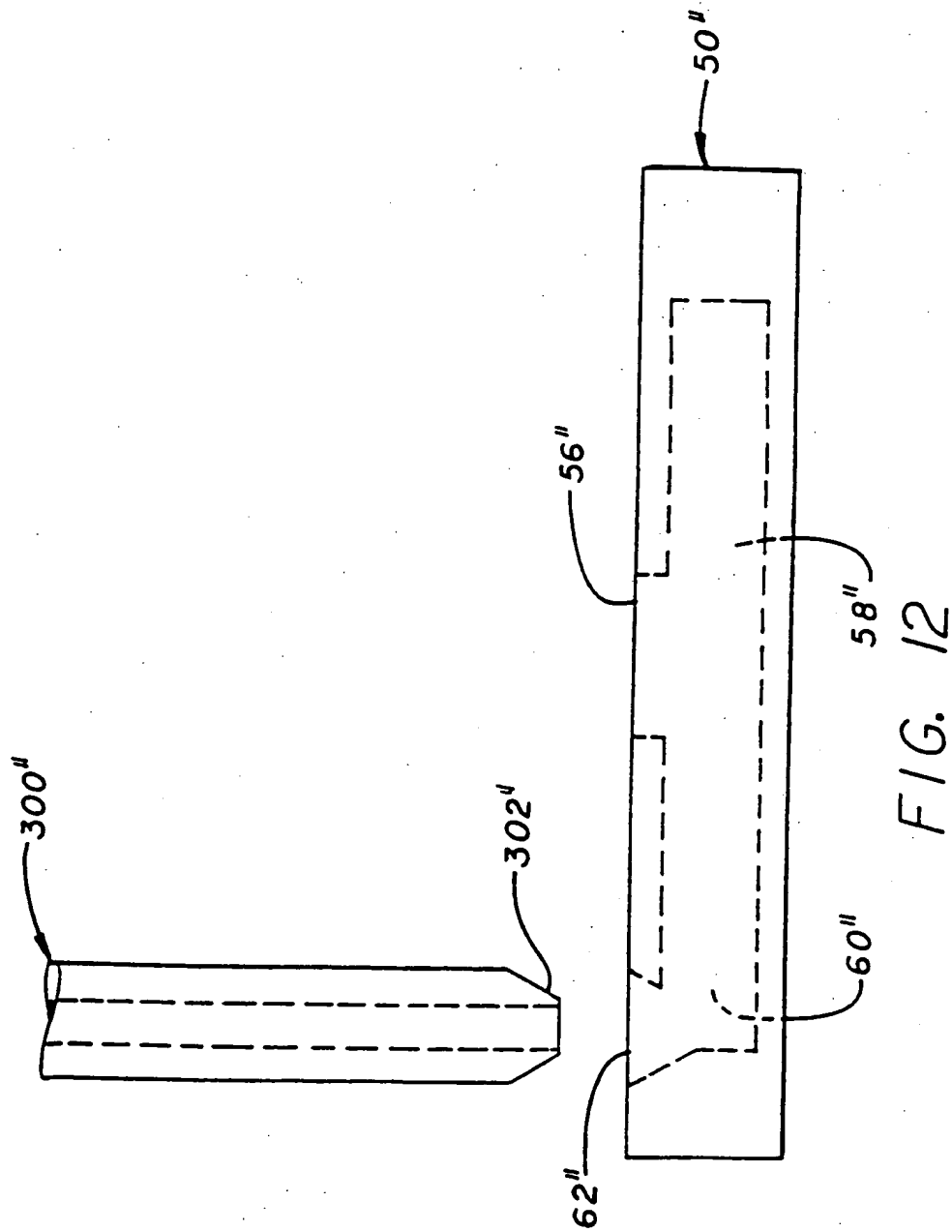


FIG. 11

12/16



13/16

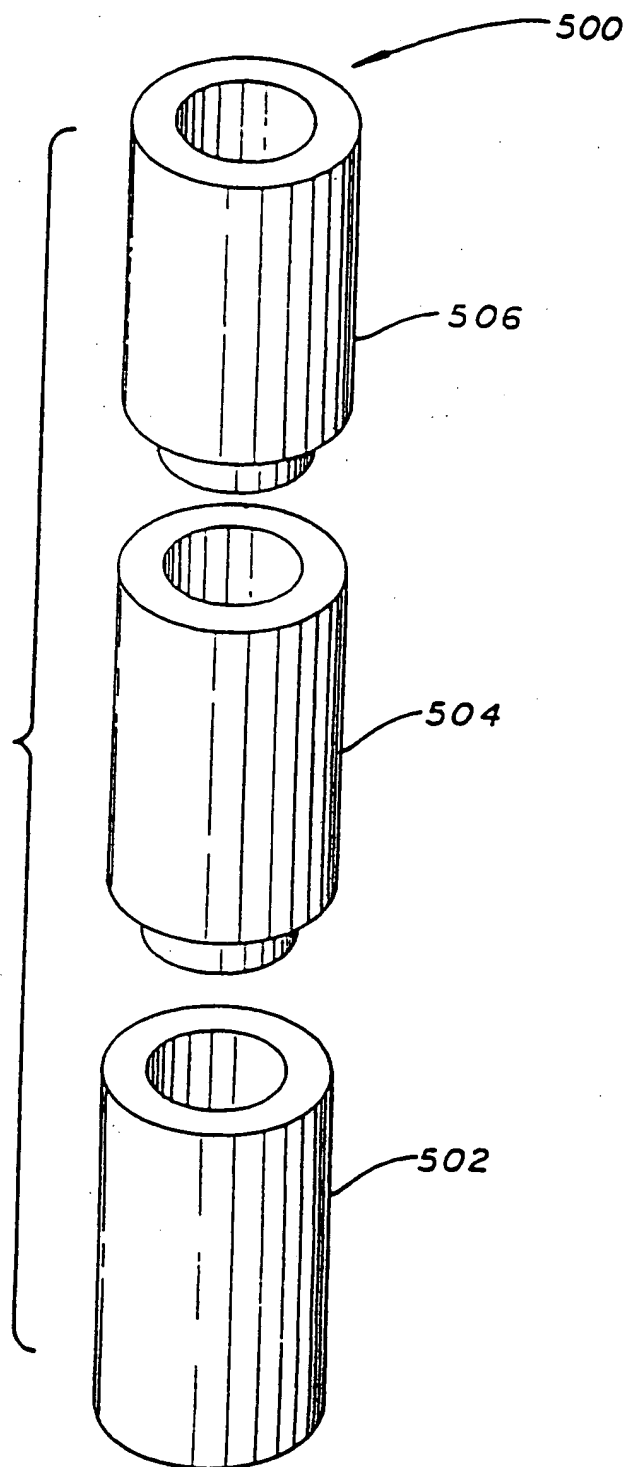


FIG. 13

14/16

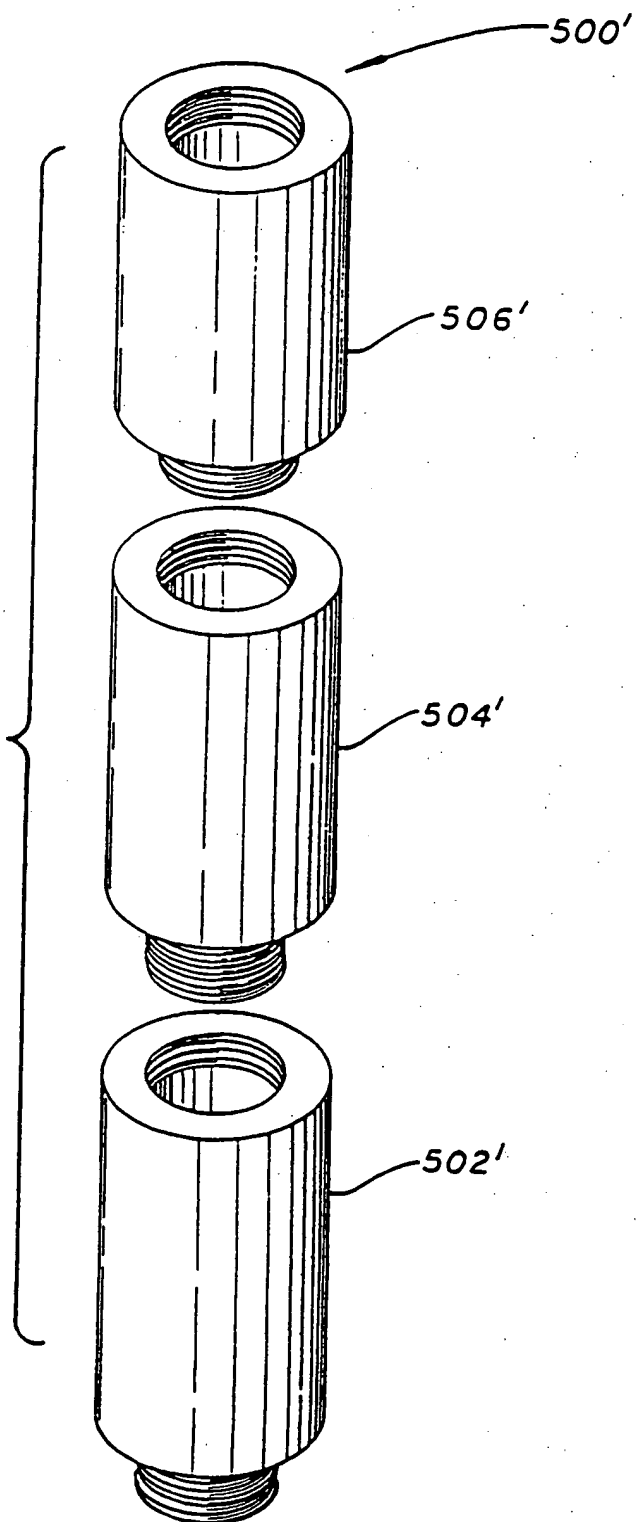


FIG. 13a

15/16

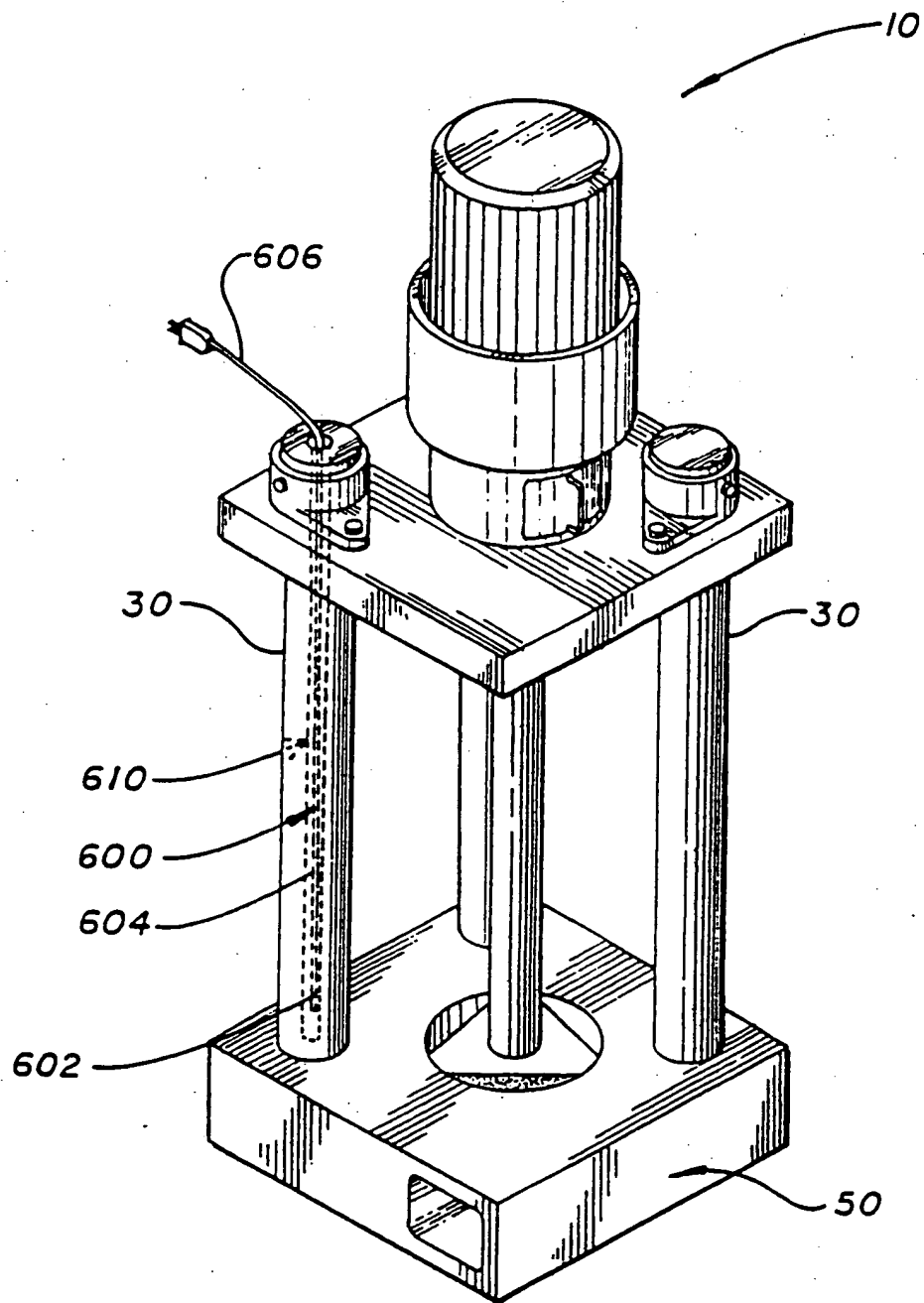


FIG. 14

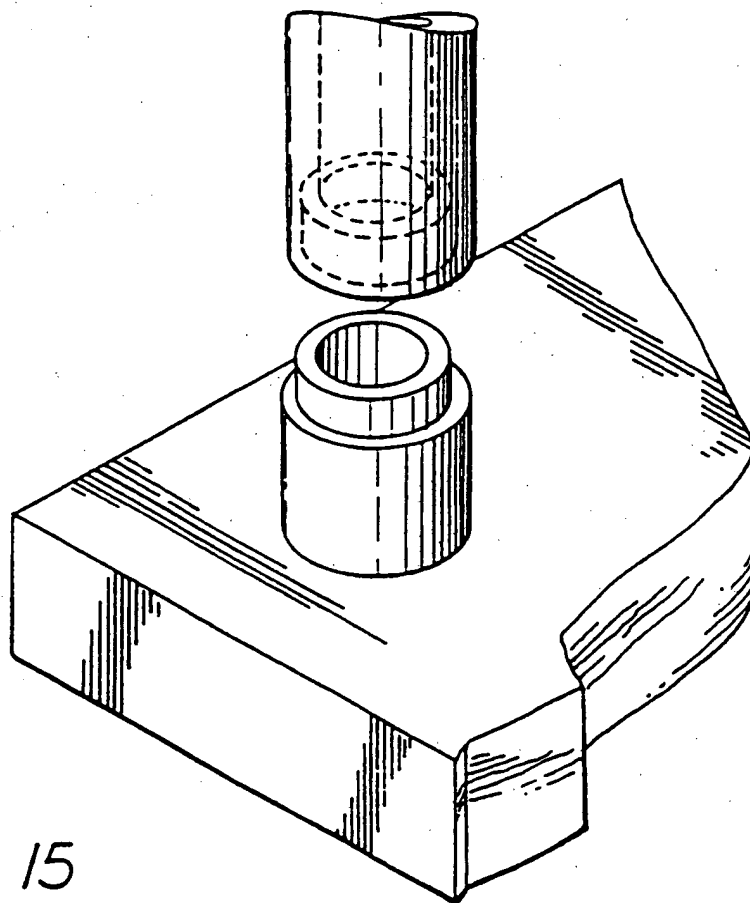


FIG. 15

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 97/22440

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
A	<p>GB 1 185 314 A (CAMAC GEORGE) 25 March 1970 see column 1, line 28 - column 2, line 57; figure 3</p> <p>-----</p>	

